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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/532,709

04/27/2005

Takeshi Kawai

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EXAMINER

KEYS, ROSALYND ANN

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

08/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,709

Applicant(s)

KAWAI ET AL.

Examiner

Rosalynd Keys

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-21 are pending.

Claims 1-21 are rejected.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lien et al. (US 2,868,854) in view of Frey (US 2,372,320).

Lien et al. teach isomerization of alkyl benzenes in the presence of HF-BF₃ (see entire disclosure, in particular column 5, line 65 to column 7, line 75).

Lien et al. differ from the instant invention in that Lien et al. do not disclose the origin of their starting alkyl benzenes.

Frey discloses a process for preparing alkyl benzenes by alkylation of benzene in the presence of HF (see entire disclosure, in particular page 2, column 1, lines 28-60 and page 3, column 2, line 22 to page 4, column 1, line 43). The presence of a Lewis acid is not taught.

One having ordinary skill in the art at the time the invention was made would have found it obvious to utilize the alkyl benzenes of Frey in the process of Lien et al., since Frey teach that his alkyl benzenes are suitable as raw materials for various chemical processes and the alkyl benzenes of Frey meet the requirements of suitable starting materials for the process of Lien et al. (see column 2, lines 6-26).

One having ordinary skill in the art at the time the invention was made would have been motivated to make the alkyl benzenes of Lien et al. by the method of Frey, since Frey teaches that hydrofluoric acid is an excellent catalyst for the alkylation of benzene and that it is particularly advantageous in the production of ethyl benzene (see page 3, column 2, lines 22-40).

Frey further differs from the instant claims in the molar ratio of Broensted acid to the aromatic compound, the mole ratio of olefin to aromatic compound; and the preferred temperature range for alkylation. One having ordinary skill in the art at the time the invention was made would have found it obvious to modify these parameters in order to determine the optimum reaction conditions. Further, changes in temperature, concentrations, or other process conditions of an old process does not impart patentability unless the recited ranges are critical,

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i.e., they produce a new and unexpected result. *In re Aller et al.*, (CCPA 1955) 220 F2d 454, 105 USPQ 233.

Lien et al. in view of Frey further differ from the claims in that they do not teach carrying out the alkylation and isomerization in the same single reaction chamber. One having ordinary skill in the art at the time the invention was made would have been motivated to carrying out the alkylation and isomerization steps in one reaction vessel, in the absence of unexpected results, as this would save both time and equipment.

6. Claims 1-5, 7-11, and 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olah (US 3,766,286) in view of Frey (US 2,372,320).

Olah teach isomerization of alkyl substituted aromatic hydrocarbons in the presence of a catalyst composition comprising a Lewis acid and Bronsted acid (see entire disclosure, in particular column 1, line 70 to column 4, line 44).

Olah differs from the instant invention in that Olah does not disclose the preparation of the feedstock for his reaction.

Frey discloses a process for preparing alkyl benzenes by alkylation of benzene in the presence of HF (see entire disclosure, in particular page 2, column 1, lines 28-60 and page 3, column 2, line 22 to page 4, column 1, line 43).

One having ordinary skill in the art at the time the invention was made would have found it obvious to utilize the alkyl benzenes of Frey in the process of Olah, since Frey teach that his alkyl benzenes are suitable as raw materials for various chemical processes and Olah teaches that any alkyl substituted aromatic hydrocarbon is suitable as a feedstock in his process.

One having ordinary skill in the art at the time the invention was made would have been motivated to make the alkyl benzenes of Olah by the method of Frey, since Frey teaches that hydrofluoric acid is an excellent catalyst for the alkylation of benzene and that it is particularly advantageous in the production of ethyl benzene (see page 3, column 2, lines 22-40).

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Olah further differ from the instant claims in the molar ratio of Broensted acid to the aromatic compound, the mole ratio of olefin to aromatic compound, and the preferred temperature range for alkylation. One having ordinary skill in the art at the time the invention was made would have found it obvious to modify these parameters in order to determine the optimum reaction conditions. Further, changes in temperature, concentrations, or other process conditions of an old process does not impart patentability unless the recited ranges are critical, i.e., they produce a new and unexpected result. *In re Aller et al.*, (CCPA 1955) 220 F2d 454, 105 USPQ 233.

Olah in view of Frey further differ from the claims in that they do not teach carrying out the alkylation and isomerization in the same single reaction chamber. One having ordinary skill in the art at the time the invention was made would have been motivated to carrying out the alkylation and isomerization steps in one reaction vessel, in the absence of unexpected results, as this would save both time and equipment.

Response to Arguments

Rejection of claims 1-14 under 35 U.S.C. 103(a) as being unpatentable over Lien et al. (US 2,868,854) in view of Frey (US 2,372,320)

7. Applicant's arguments filed May 30, 2007 have been fully considered but they are not persuasive.

Applicants submit that that Comparative Examples 1-7 correspond to the procedure described in Frey, et al., discussed *infra*; and that Comparative Example 8 compares to the processes in Lien, et al. and Olah, discussed *infra*, in which an isomerization is carried out under the presence of HF and BF₃. Thus, it is respectfully submitted that the Examples and Comparative provide a comparison with the closest prior art. The Examiner disagrees. In Comparative Examples 1-7 the alkylation is carried out in the presence of BF₃. However, the alkylation process

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of Frey et al. is not conducted in the presence of BF₃, in fact Frey et al. teach that the preferred alkylation catalyst is hydrofluoric acid (see column 1, line 50 to column 2, line 27). In Comparative Example 8 BF₃ is not used in the isomerization process, whereas Lien et al. teach the combination of HF and BF₃ (see entire disclosure, in particular column 1, lines 58-71) and Olah teach the use of a combination of a Lewis acid and a Bronsted acid for the isomerization (see entire disclosure, in particular column 2, line 25 to column 3, line 10). Thus, the Comparative Examples 1-7 do not correspond to Frey et al. and Comparative Example 8 does not correspond to Lien et al. and Olah. Thus, the comparative examples in the specification do not represent a comparison with the closest prior art and thus are not sufficient to overcome the prima facie obvious rejection.

8. The Applicants submit that one of ordinary skill in the art concerned with in Lien, et al., to rearrange certain secondary alkyl benzenes, would not have looked to the teachings of Frey. It is respectfully submitted that there would have been no motivation for combining the teachings of these references as applied by the Examiner, absent hindsight use of Applicants' disclosure, which of course is improper under 35 USC 103. The Examiner disagrees. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case both the alkylation process and the isomerization process were known from the prior art, namely Frey teaches the alkylation process and Lien et al. teach the isomerization process. The Examiner believes that one having ordinary skill in the art would have combined the teachings of Lien et al. with the teachings of Frey because the starting material

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used in the isomerization of Lien et al. is produced by Frey, in particular Frey produces alkyl aromatics, such as isopropyl benzene (see example 1) and Lien et al. uses secondary alkyl benzenes, such as isopropyl benzene in their isomerization process (see entire disclosure, in particular column 1, lines 13-18). Thus, one having ordinary skill in the art would have found it obvious to combine the teachings of Frey and Lien et al., since the product produced by Frey is a suitable starting material in the process of Lien et al. The instant claims are prima facie obvious over the combination of Frey and Lien et al., since in combination these references teach each and every element of the claimed invention, including the newly added limitation wherein the alkylation is conducted without the presence of a Lewis acid. For the above reasons, this rejection is maintained.

Rejection of claims 1-5, 7-11, 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over Olah (US 3,766,286) in view of Frey (US 2,372,320)

9. Applicant's arguments filed May 30, 2007 have been fully considered but they are not persuasive.

10. The Applicants submit that one of ordinary skill in the art concerned with in Olah, pertaining to an isomerization reaction, would not have looked to the teachings of Frey; in particular, there would have been no motivation from the combined teachings of these references, or in any other manner to one of ordinary skill in the art, to motivate the combination of the teachings of these references. It is respectfully submitted that only through hindsight use of Applicants' disclosure, which is improper under 35 USC 103, would one have combined the teachings of Olah and Frey, as applied by the Examiner. The Examiner disagrees. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon

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hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case both the alkylation process and the isomerization process were known from the prior art, namely Frey teaches the alkylation process and Olah teaches the isomerization process. The Examiner believes that one having ordinary skill in the art would have combined the teachings of Olah, with the teachings of Frey because Frey produces the starting material used in the isomerization of Olah, in particular Frey produces alkyl aromatics (see entire disclosure) and Olah uses alkyl aromatics in their isomerization process (see entire disclosure). Thus, one having ordinary skill in the art would have found it obvious to combine the teachings of Frey and Olah, since the product produced by Frey is a suitable starting material in the process of Olah. The instant claims are prima facie obvious over the combination of Frey and Olah, since in combination these references teach each and every element of the claimed invention, including the newly added limitation wherein the alkylation is conducted without the presence of a Lewis acid. For the above reasons, this rejection is maintained.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the

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date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosalynd Keys whose telephone number is 571-272-0639. The examiner can normally be reached on M, W & F 5:30-7:30 am & 1-5 pm; T & Th 5:30 am-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rosalynd Keys/
Primary Examiner
Art Unit 1621

August 19, 2007